

MASTER COPY.

- SF 25 C - "FALKE" - TEDS-No 653

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Flight and Operations Manual

for the powered glider

SF 25 - "FALKE", Series C

from serial No. 44160 onwards

Edition of April 1976

This manual is always to be kept aboard.

It is the manual for the

SF-25- "FALKE", Series C:

Registration No.: G-MILD

Serial No.: 44190

Manufacturer: Scheibe-Flugzeugbau

Owner: Borders Gliding Club Ltd

The "Flight manual" section summarizes the information necessary for the operation of the Falke. The "Operations "Manual" section provides more detailed information relating to both flying and maintaining the Falke.

This is the Flight Manual assigned

to the aircraft registered G- MILD



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Record of Changes to the manual

Change No.	Title	Page	Date	Signature
1	Abatement of Noise	div.	23.9.76	gez.Friedel
2	Remarcks for wing main fitting assy	div.	07.11.83	gez.Nährlich
3	CAA SUPPLEMENT 1/ISS 1. LIMITATIONS.	REAR OF MANUAL ISSUE	23/3/1988	<i>[Signature]</i>
4	CAA SUPPLEMENT 1 ISSUE 1 LIMITATIONS (REVISED)	REAR OF MANUAL	2/6/2001	<i>[Signature]</i>

F = Flight manual

B = Operations manual

The pilot is responsible that all information contained in this Flight manual is adhered to.

1. Operating Data and Limitations

1.1. Powerplant

Limbach SL 1700 EA

Max. permissible revolutions	3550 RPM
Take-off power (5 min)	3550 RPM (60 HP)
Max. permissible continuous speed	2800 RPM (49 HP)
Brake revolutions: min. 2600 RPM	
Max. permissible cyl. head temp.	250°C

1.2. Fuel

Aviation gasoline 100 L or
"Premium" automobile gasoline (at will)

Capacity of fuel tank: 44 litres (11.6 us gal.)
or 55 litres (14.5 US gal.)

1.3 Lubricants

wholly consumable

Air temperature	Viscosity	Sorts
above + 20°C	SAE 40 or SAE 30 or SAE 20w/50	HD-Engine-Oil from Aral, Shell, BP, Esso, Castrol
0 to + 20°C	SAE 20 w/50	
below 0°C	SAE 10 w/40 or 10w/30	

oil quantity: 2,5 l; (0.66 USgal.)
minimum quantity: 1,5 l (0.40 USgal.),
lower dipstick indication

Oil pressure:	Temperatures:
Range 1.0...4.0 atü	Minimum 50°C (Take-off)
Minimum 1.0 atü (engine idling)	Maximum 120°C (Minimum 70°C in case of icing conditions)

1.4. Propeller

Two-blade, fixed-pitch wooden propeller
HO 11* - 150 B 65 L or
HO 11* - 150 B 75 L

1.5. Powerplant monitoring equipment

Tachometer

Operating range (green field)	700 - 2800 RPM
Caution-range (yellow field)	2800 - 3550 RPM
max. permissible speed (red line)	3550 RPM

Hours of operation indicator

Counts 2800 engine revolutions as 1 min. of engine operation. 1/100 of an hour is indicated by the last digit.

Oil pressure gauge

Operating range (green field)	1.0 - 4.0 atü
max. pressure (red line)	4.0 atü

Oil temperature gauge

Operating range (green field)	50°C - 120°C
minimum (red line)	50°C
max. temperature (red line)	120°C

1.6 Amperemeter

Needle indicates + upon charging.

1.7 Main switch

disconnects the battery from the mains. To be switched on before flight and to be switched off after landing. When soaring, switching off is permissible. With engine running, only switch off in case of emergency.

1.8 Automatic fuses

The main circuit (not the starter circuit) is protected against short circuit by a 25 A fuse (battery) and a 20 A fuse (generator). If a fuse cuts out in case of overloading, press the red button to switch it on after 2 min., resp. after removing the defect.

1.9 Antenna

An antenna for VHF COM is mounted in the fin. Find its plug under the luggage compartment.

1.10 Barograph connection

To record the time of engine operation (in competition), connect the barograph to the barograph terminal under the luggage compartment.

Red: + 12 V, brown: ground, flying fuse behind the instrument panel.

1.11 Terminal strip for additional electrical equipment

A terminal strip for additional electrical equipment (COM, ACL etc.) is attached to the firewall. Mains voltage: 12 V DC, negative ground. Fit the strip with fuses required for the equipment. The regulations concerning the installation of such equipment have to be observed.

1.12 Airspeeds

Maximum permissible airspeed		118 mph
Manoeuvring airspeed		94 mph
with extended spoilers		118 mph
Airspeed indicator markings:		
red line		118 mph
yellow field (caution range)	94 to	118 mph
green field (normal range)	50 to	94 mph

1.13 Weights

Empty weight	approx.	882 lbs
Load (including fuel)	approx.	463 lbs
max.permissible all-up weight		1345 lbs
max.gross weight of non-lifting parts		992 lbs

1.14 Center of Gravity in Flight

Reference line: Line through trailing edge and tangent to undersurface of wing rib 6 ($y = 86.6$ inches from plane of symmetry).

Reference point RP: 78.74 inches in front of the leading edge at rib 0 (20.47 inches from plane of symmetry).

Max.forward position of cg: 84.37 inches behind RP

Max.rearward position of cg: 91.89 inches behind RP

1.15 Placards and Warnings

In addition to the Flight Limitations Placard and the fireproof Aircraft Data Plate, the following placards are mounted:

1. On the left cockpit wall at the spoiler lever:
-AIRBRAKES - PULLING ALL THE WAY BACK OPERATES
WHEEL BRAKE
2. Between the seats, close to
the trim lever:
NOSE UP - TRIM - NOSE DOWN
3. On the instrument panel at the respective
operating controls:
PULL TO CHOKE, CABIN HEATER PULL TO OPEN, MASTER
SWITCH, FUEL - OFF - ON, CARBURETOR HEATER,
THROTTLE, IGNITION - CONTACT - OFF, VENTILATION,
STARTER, PROPELLERBRAKE. COOLING AIR FLAP-CLOSED-
OPEN
4. At the canopy emergency jettison handle:
CANOPY EMERGENCY JETTISON:
PULL ON TOP AND FRONT KNOBS AND PUSH CANOPY TO THE
RIGHT.
5. On the back wall of the baggage compartment:
BAGGAGE: Max.: 22 LBS
6. On the fuselage, close to the tank filler cap:
Aviation gasoline AVGAS 100 L or
"Premium" automobile gasoline
44 litres(11.6 US gal)or 55 litres (14.5 US gal.)
7. On the fuselage fabric, above the main wheel:
"2.1 atü"
On the fuselage fabric, above the tailwheel:
"2.5 atü"
8. On the instrument panel:
Attention: Flight in rain, see Flight manual!
"Do not smoke", "When engine is running open
cooling air flap"
Start-Check: Canopy locked, Trimmer set, Airbrake
locked, Controls free, Fuel on, Fuel capacity,
Cooling Air Flap open, Safety Belts put on.
9. On the oil filler cap: "Oil 2,5 liter"

2. Operating instructions

2.1 General

The "Falke" is a self-launching powered glider. According to the German requirements, attachment "B" to the Private Pilot License entitles a pilot to fly it.

Prior to flight, exact information about aircraft and engine is needed. It is necessary to study the Flight and Operations manual and to familiarize oneself with every detail of aircraft and engine.

2.2. Pre - Flight Inspection

Before operation and, above all, after assembly, a pre - flight inspection is necessary. If the pilot does not perform this inspection himself, he has to make sure that it has been done properly.

The external inspection is made by a round of the aircraft, during which everything shall be checked carefully:

1. Is the ignition shut off?
2. Check the fuel quantity in the tank and the tank filler cap for safe mounting.
3. Is the main bolt secured?
4. Are the ailerons connected and secured?
5. Are the spoilers connected and secured?
6. Are the coverplates under the wings at the main spar fixed to the fuselage?
7. Check the right wing for external damage in plywood and fabric.
8. Check the aileron carefully for damage, aileron bearings for unacceptable play, and the aileron actuating lever for cracks. Are outer aileron bearing and pushrod connection secured? Make sure that the ailerons move freely!
9. Check horizontal and vertical tail surfaces for external damage in plywood or fabric!
10. Is the horizontal stabilizer correctly assembled and secured?
11. Is the elevator connected to the pushrod and secured?
12. Check the Bowden cable of the trimtab for correct mounting.
13. Are the control surfaces properly connected and secured? Make sure that they move freely! Particular attention must be paid to the lower rudder bearing.
14. Remove the cover from the pitot. If necessary, drain the pitot tube by removing the drainage plug (close to the elevator actuator).
15. Check the tailwheel bearings and tire pressure (2,5 atü).
16. Check the fuselage fabric for damage, including the underside.

17. Inspect the left wing and aileron (according to items 7 and 8).
18. Check the air pressure in the main wheel tire (2,1 atü). Is the axle bolt properly secured?
19. Check the wheel brake.
20. In case of flying without parachutes: are the spaces for parachutes filled with sufficiently large and hard pillows? Are the pillows secured against slipping?
21. Check the rudder cables for wear and tear, particularly at the guides.
22. Are the safety belts and their fittings in proper condition?
23. Are the aircraft documents complete and not expired?
24. Check the canopy latch.
25. Is the loading within the permissible range?
26. Check for foreign objects!
27. From the cockpit seat, check all control surfaces for freedom of movement and the ability of the control system to transmit forces (attempt to move each surface while a helper holds it fast). Make sure that the rudder moves in the correct sense! Make an operating test of the spoilers and elevator trim!
28. The daily inspection of the powerplant is to be carried out according to the engine manual.

2.3 Starting the engine (see also the Limbach
SL 1700 manual)

1. Place fuel shut-off valve in ON position, and ignition switch in CONTACT position.
2. Choke (but only if the engine is cold), and set the throttle to idling position.
3. Before pressing the starter button, the master switch is to be switched on.

Then press the starter button. Normally a cold engine will start within 2-3 seconds. Upon starting, the choke must be opened (pushed) immediately to prevent flooding. If the engine has not started after two attempts, open choke and try starting with throttle closed or slightly opened. If the engine does not start after five attempts, it is probably flooded. Switch off ignition, push choke, open throttle completely, and turn the engine over backwards by hand eight to twelve times to clear it.

Then attempt to start at full throttle. Reduce power immediately when engine starts.

In case of starting the warm or half warm engine: choke open (pushed), throttle closed or slightly cracked.

The engine can also be "propped" to start. Procedure as under 2.3.

4. Apply brake, and permit the engine to warm up at about 1800 RPM until it does not stop any longer with throttle at idle, and accelerates smoothly in response to full throttle (minimum oiltemp. 50°C).
5. At full throttle, engine must speed up to 2600 RPM!
6. The Falke can be taxied without any help. The rudder as coupled to the swiveling tailwheel. The minimum turn diameter is about 40 ft.

2.4 Take-off, Climb (caution! see also 2.11: flight in rain)

1. Pre-flight check according to the placard in the cockpit.
2. Take-off: throttle full open, trim neutral, stick in middle position. At about 45 mph, pull the plane off the ground, hold it level to gain speed and climb at about 60 mph!

2.5 Cruising Flight

With engine running, level speed range is 45 mph to 93 mph.

Normal cruising speed is about 75-93 mph at 2500-2800 RPM.

In case of increased air moisture (especially near clouds) and when the air temperature is between -10° and $+18^{\circ}$ C ($14-64^{\circ}$ F), carburetor icing may occur. It is noticed by decrease in RPM and engine roughness. Pull carburetor heater to full on at once.

Carburetor icing may also occur during long periods of engine - throttled operation. Therefore, pull carburetor heater "on" before a long glide or landing approach. Remember, however, that the engine will not develop full power with carburetor heater applied; push control to off in case of a missed approach or go-around situation.

Operating of carburetor heater results in an almost imperceptible RPM decrease (unless there is already carburetor icing).

Be sure that carburetor heater is full off in warm, dry air.

2.6 Landing

Landing can be performed with engine running or stopped.

1. Enter the landing pattern at a suitable altitude.
2. Approach at about 55-60 mph. Glide angle can be controlled by means of the airbrakes. Sinking speed can also be increased by slipping.

3. At about 45 mph, the Falke touches down first with the tailwheel, then with the main wheel.
 4. The wheel brake is effective: the aircraft can be stopped within a short distance.
 5. Max. landing roll distance 100 m with wheel brake operating.
- 2.7 Engine Stop and Restart in the air

1. Stop engine:
 - a) Reduce throttle to idle
 - b) Reduce airspeed to about 50 mph
 - c) Shut off ignition; if necessary, pull propeller brake (handle under the instrument panel, left side).
 - d) If necessary, operate the starter to the propeller's horizontal position.
2. Restarting the engine in the air corresponds to item 2.3. Airspeed about 60 mph.

In case of repeated starting in the air, attention must always be paid to the fuel quantity. Before starting the engine, the cooling air-flap has to be opened.

2.8 Soaring Flight

Circle at about 50-60 mph.
At 50 mph, the sinking speed is less than 200 fpm.

2.9 Stalling Characteristics and Slow Flight

With engine stopped as well as with engine running at full throttle, the stalling speed is about 43 mph. At this airspeed, rudder and ailerons are still fully effective. When the stick is pulled completely back, at forward CG's the Falke lowers the nose, at rear CG's still flies, rarely with a wing dropping. By easing stick forward the Falke flies normally again.
Falling off toward the outside in circling flight: neutralize stick, and full rudder in the original turning direction.

2.10 Spin

At forward CG's it is very difficult to attain a stationary spin. At rear CG's, spin can be started by stalling and crossing ailerons and rudder. Recovery: Neutralize stick, rudder normal. Do not exceed the max. permissible airspeed.

Aerobatics are not permitted!

2.11. Flight in Rain - Caution!

The Falke wing has a glider airfoil and is sensitive against rain. Raindrops on the wing will reduce the lift. This results in an increase of the minimum airspeed:

Minimum airspeed with wet wings is about 50-53 mph, and the wet wing drops easily, whereas the dry wing has very harmless stalling characteristics and a minimum airspeed of about 43 mph.

In case of flight in rain, fly at an airspeed of at least 55 mph! Climb and approach with 65 mph.

Avoid steep turns!

A rainedampened wing is to be dried off before take-off.

2.12. Fastening Points for Parachute Ripcords:

Red markings at the fuselage crosstube above the backrest.

2.13. Canopy Emergency Jettison

Pull the latch on the top and the emergency release knob at the front, and push canopy to the right.

2.14 Introduction

In any case, a check flight together with a pilot familiar with the "Falke" is necessary before the first solo flight.

In particular, glider pilots without any experience in motorflying should remember this.

3. Performance Data

3.1 Take-off Performance

The performance data given here have been calculated on the basis of measured values found during the type investigation by the Aeronautical Inspection Authority. They can be repeated under the following conditions, if aircraft and engine are in good condition and the pilot has an average qualification:
 Max. permissible all-up weight: 1345 lbs.
 Flat landing field with short grass turf in good condition.

No wind.

Take-off speed: approx. 45 mph

Climbing speed: approx. 53 mph

	Field Elev. ASL meters	Outside air temp., centigrade:			
		-15°C	0°C	+ 15°C	+30°C
Take-off run, meters	0	129	151	172	194
	250	140	161	183	204
	500	151	173	195	217
	750	162	183	205	227
	1000	172	197	221	245
Take-off to 50 ft (15m), meters	0	299	330	362	393
	250	315	347	378	409
	500	331	363	396	428
	750	347	379	412	445
	1000	364	399	434	471

3.2 Climbing performance at max. all-up weight
(sea level)

Rate of climb: approx. 500 fpm.

3.3 Airspeeds

Maximum continuous level speed: approx 93 mph,
at 2800 RPM.

Approach speed: approx. 55-60 mph

Landing speed: approx. 43 mph

3.4 Ceiling

Service ceiling (rate
of climb 100 fpm):

approx. 13.125 ft,
ASL

Absolute ceiling:

approx. 16.400 ft,
ASL

3.5 Range and Endurance at zero wind

RPM	Fuel Con- sumption lb/h	Airspeed mph	44 l		55 l	
			Endurance h:min	Range miles	Endurance h:min	Range miles
2500	9,5	80	4 ^h 40'	373	5 ^h 45'	466
2700	10,8	87	4 ^h 15'	354	5 ^h 05'	435
2800	12,1	93	3 ^h 40'	338	4 ^h 30'	422

3.6 Performance with engine stopped

Minimum sinking speed: approx. 200 fpm at 47 mph.
Glide ratio: about 1 : 22 at 56 mph.

4. Center-of-Gravity Position and Load Sheet

Remember: The pilot is responsible for correct
loading of the aircraft.

4.1 Permissible Center-of-Gravity Positions

After repair, installation of auxiliary equipment
new painting etc., the empty-weight center of
gravity has to be made sure to remain within
permissible limits; in special cases, balancing
weights must be added. An authorized inspector
has to certify correct weighing.

The center-of-gravity positions for various empty weights are as follows:

Empty weight, lbs.	860	882	904	926	948
Cg position (in. behind RP)	89,1 to 92,4	89,0 to 92,4	88,9 to 92,4	88,8 to 92,4	88,7 to 92,4

Horizontal reference line: line through trailing edge and tangent to undersurface of wing rib 6 (y = 86.6 inches from plane of symmetry).

Reference point (RP): 78.74 inches in front of leading edge at rib 0 (20.47 inches from plane of symmetry).

If the empty-weight center-of-gravity position is within these limits, the center-of-gravity in flight will be within allowable limits, if the load in the cockpit is as specified in section 4.2 below. The center-of-gravity position in flight has considerable influence on flight characteristics. For this reason, observance of the stipulated center-of-gravity range is very important.

The following range of all-up-weight center-of-gravity positions is approved:

Max. forward position: 84.37 inches behind RP

Max. rearward position: 91.89 inches behind RP

4.2 Load Sheet

Load in the cockpit (crew including parachutes):

Max. 397 lbs in both seats combined

Min. 132 lbs

Baggage: max. 22 lbs.

Take care that the loading (fuel and possible baggage taken into account) does not exceed the maximum permissible value given by the Flight Limitations Placard. For fuel weight with full tank, 71 lbs (44 l) or 88 lbs (55 l) must be taken into account.

5. Minimum Equipment

The following minimum equipment is specified by the airworthiness requirements:

- a) Airspeed indicator
- b) Altimeter
- c) Tachometer
- d) Oil pressure gauge
- e) Oil temperature gauge
- f) Amperemeter
- g) Fuel quantity indicator
- h) Four-element safety belt for each seat
- i) Flight manual (always to be kept aboard)

AIRWORTHINESS DIRECTIVE

82-134 Scheibe-Flugzeugbau

Date of issue:
July 27, 1982

Affected motorglider:
Scheibe-Flugzeugbau SF25 B, C, D "Falke" and SF25 E "Super Falke".
All serial numbers.

Subject:
Main wing assembly.

Reason:
Inspection of proper engagement of the main rigging pin
in the main wing fittings.

Action and compliance:
Before next flight and upon each wing assembly action the
inspection in accordance with "Technische Mitteilung" has
to be accomplished.

Technical publications of the manufacturer:
Scheibe-Flugzeugbau "Technische Mitteilung" No. 653-42
of 7-12-1982,
which becomes herewith part of this AD and may be obtained
from Messrs.
Scheibe-Flugzeugbau, August-Pfalz-Straße, P.O. box 1829
D-8060 Dathau.

Accomplishment and log book entry:
Action to be accomplished by a skilled person.
TM and AD to be included in the flight and operating manual
until a final regulation has been made.



Subject: Main wing assembly (fittings with main wing centre pin)

Effectivity: Motorglider SF 25 B "Falke" all serial numbers
 Motorglider SF 25 C "Falke" all serial numbers
 Motorglider SF 25 D "Falke" all serial numbers
 Motorglider SF 25 E "Super-Falke" all serial numbers

Accomplishment: Before further flight, and upon each Wing assembly

Reason: Inspection of proper engagement of the main rigging pin in the main wing fittings

Instructions: Before further instructions the following must be checked:

1. It must be checked that the main rigging pin is fully through the bottom lug fitting. With the main rigging pin pulled fully upwards by means of the top handle, such that the 2.5 mm safety pin is hard against the lower face of the top boom lug fitting, inspect the amount of plain portion of main pin shank protruding below the port bottom boom lug fitting (Wings imburdened). If difficulty in the inspection is encountered when the Motorglider is assembled due to poor access, the wings must be removed and port wing inspected. Certainly upon the following assembly the inspection must be made again (when necessary, by help of a mirror and a handlamp).
 Should no plain shank be visible protruding below the port bottom lug fitting, according to 1., the aircraft shall not fly until the cause has been established, and rectified. For that, contact the manufacturer Fa. Scheibe Flugzeugbau.
2. Normally the main rigging pin has one safety pin hole. If more than one safety pin hole exists the aircraft must not be flown until the correct hole has been established, and the redundant hole made unusable (flush rivet)

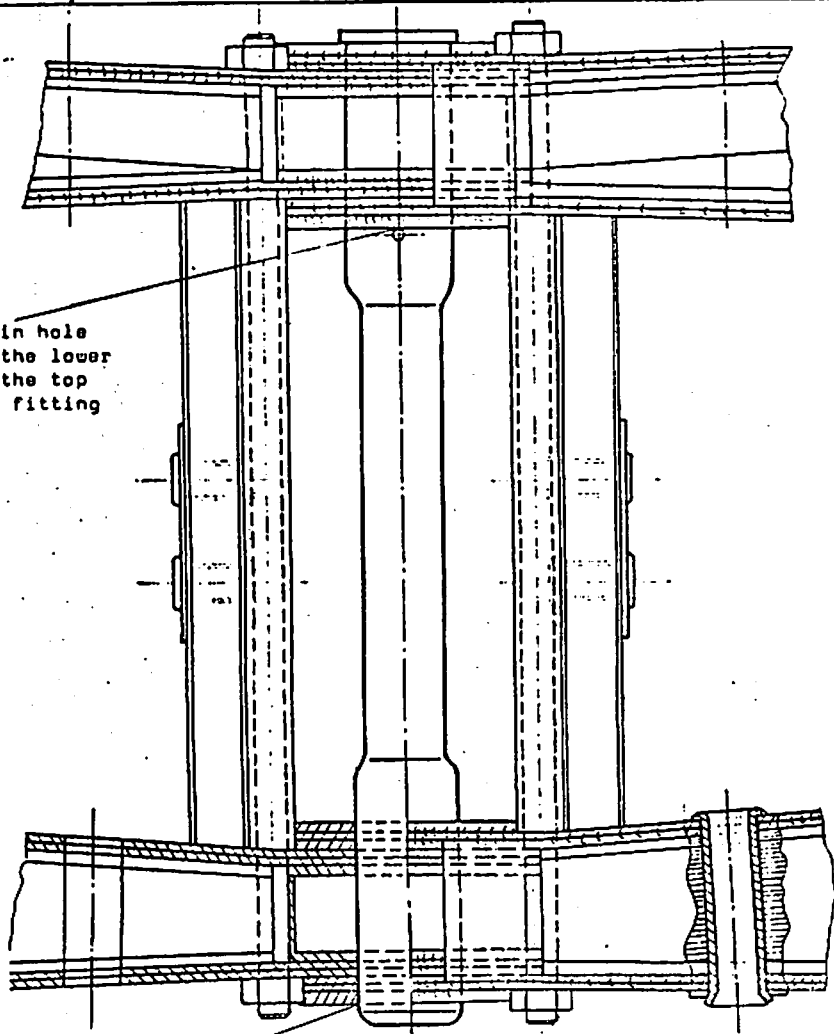
If the inspection according to 1., shows that the main rigging pin is not fully through the bottom lug fitting with the plain portion, the first thing is to check that, with the main rigging pin fully down, another safety pin hole could be made, so that the plain portion is through the bottom lug fitting. Another thing to check is that the female lug fittings has not been splayed through a wrong assembly. In case the fittings must be straightened and a new inspection according to 1., must be made, contact Fa. Scheibe Flugzeugbau.

Important notice: Extreme care must be exercised when aligning the male/female lug fittings to ensure that female fittings are not seized during mainplane rigging and derigging.
 Do not use force by bringing in the main rigging pin (for example by means of a hammer or similar), but carefully insert by hand with the wings imburdened.

When there is doubt about the correct assembly, or any damage is determined which is likely to have a detrimental effect upon the airworthiness of the aircraft, contact Fa. Scheibe Flugzeugbau.



Safety pin hole
against the lower
face of the top
boom lug fitting



Plain portion of the main
rigging pin must protrude below
port bottom boom lug fitting

SCHEIBE FLUGZEUGBAU GMBH
Dachau, Aug. Of. Lt 7-Str. 23

12. Juli 1982 *Handwritten signature*

1. Assembly and Disassembly, Miscellaneous

1.1 Assembly

Prior to assembly, the fittings are cleaned from dust and all boreholes are greased. This work is to be performed with particular thoroughness after road transport. It is advisable to spread the aircraft components on the ground in a pattern corresponding to the plane's outline. Thus they are within immediate reach during assembly.

First the left wing is lifted by three men, one at the tip and two at the root, and one holds the fuselage. The rear wing attachment fitting is connected to the corresponding stud mounted on the fuselage. The man at the wing tip then moves the end of the wing forward until the forward wing attachment stud mounted on the fuselage engages the fitting on the wing root rib.

Assembly of the right wing corresponds to that of the left. Pay particular attention, however, that the fuselage is perfectly upright and is not inclined to one side or the other.

When moving the right wingtip forward, its height has to be adjusted so that the two main fittings can slide into each other. It is advisable that one man directs the two men at the wing tips from the cockpit, until the boreholes in the main fittings line up and the single-element main bolt can be inserted. Secure the single-element main bolt with a Fokker pin. Subsequently, the aileron actuating system is linked up, and the spoiler cables are connected. The plates covering the center section under the main spar are fixed to the fuselage.

Mounting of the horizontal tail: The fittings at the underside of the horizontal stabilizer are

connected to the two studs fastened to the fuselage (elevator deflected up). Then the forward stabilizer fitting is secured with a castle nut and a Fokker pin. Now the elevator actuating lever is connected to the push rod by means of a bolt, and secured. With the trim lever in the cockpit in "Nose-Down" position, mount the Bowden cable actuating the trim tab.

At last, the outrigger stabilizing wheels under the wings are mounted and secured.

1.2 Disassembly

Disassembly proceeds in reverse order to assembly. Thus, begin with the horizontal tail. When disassembling the wings, make sure that the aileron actuator and the spoiler cable are disconnected, and the main bolt is disengaged. The main bolt can best be operated if the two helpers at the wing tips lift the wing to relieve the main fittings of any tension. To remove the wings, one wing tip is moved rearward until the main fitting is free; then the wing root is pushed forward.

1.3 Refuelling

Use "Premium" automobile gasoline or AVGAS 100 L aviation gasoline.

During refuelling, observe the following:

1. Filter through a chamois when filling the tank.
2. Cover filler-cap in case of rain or dust.
3. Do not smoke or manipulate at open fire in the vicinity of the open tank.
4. The oil is to be checked every 1-2 hours.
5. Use only the original tank-filler-cap with ventilation.

1.4 Wheelbrake Operation

The wheelbrake is an integrated shoe-type brake. The brake is connected to the spoiler actuating lever, and is actuated in the last portion of the spoiler opening motion.

1.5 Transport of the Aircraft

In case of transport on a trailer, the distance between the two supporting points for each wing should not be less than 15 feet, since otherwise damage may occur on bad roads or fields from inertia forces acting on the overhanging ends of the wings.

If the aircraft has to be transported in rain without waterproof covers, make sure that no water can enter (through control gaps, openings for pushrods, fuselage, etc.)!

When the assembled plane is moved on the airfield, make sure that the stick is tied fast with a safety-belt in order to avoid banging of the elevator, especially if the ground is quite uneven.

1.6. Propping Up

The Falke can be propped up from under the main wheel or under the steps on each side of the fuselage.

1.7. Changing the propeller

The propeller is clamped between the propeller flange and front pressure plate by six hexagonal bolts. The propeller flange is pressed onto the conical end of the propeller shaft by a central nut, and shall be pulled off only by the engine manufacturer.

To change the propeller, the spinner is removed, the six hexagonal bolts are loosened, and the propeller is pulled from the hub. When remounting, the bolts are to be tightened with a torque wrench (to 140 in lbs).

After remounting, it is important to check that the blade tips track is within 0.08 inch. The track can be corrected on propellers supplied by us by appropriate variation of tensions to which the various bolts are tightened. Subsequently, the spinner is again attached and secured.

Caution! During the first operating check, make sure that nobody stands in front of the running propeller.

If the propeller or its coating is damaged (by ground contact, transport, etc.), the propeller should be returned to the manufacturer. In case of ground contact, the crank shaft must also be inspected for damage.

2. Maintenance

2.1 General Information concerning Maintenance and Cleaning

Regular cleaning and servicing of the aircraft, particularly of the powerplant, is a precondition for safe equipment operation. According to the frequency of operation, it has to be done periodically by means of suitable materials.

Maintenance of threaded elements: If threaded element can be unscrewed only with effort, check them immediately and replace them in case of damage.

2.2 Routine Maintenance

2.2.1 Pre-Flight Inspection

The daily inspection of the aircraft before the first flight is very important, especially if the aircraft is newly assembled. If the pilot does not perform this himself, he has to make sure that it has been done properly (See flight manual, page 8).

In case of operation in winter, make sure that the wing and horizontal tail upper surfaces and all control surface gaps are thoroughly cleaned of snow and ice.

Propeller inspection: the propeller is to be inspected periodically for indentations, cracks and other damage. All bolts must be tight (secured by means of safety nuts).

The propeller is to be cleaned from time to time of insects and grass and to be inspected for accurate tracking.

2.2.2 Periodic Inspections

Powerplant. The engine is to be inspected according to the time specified in the engine handbook. Note 1.

Maintenance of the Airframe (after 100 flights or 50 hours of operation.

Begin all maintenance work with a check according to item 2.2 (pre-flight inspection).

Lubrication of the control system and control surface bearings is to be carried out in accordance with the lubrication chart in the Appendix.

The control system bearings are to be cleaned externally and lubricated with oil. To the lower rudder bearing particular attention must be paid since depending on the condition of the airfield it may get dirty. All ball-bearings are greased by the manufacturer and do not require any particular maintenance; however, if they get dirty, clean and lubricate with ball-bearing grease or vaseline.

Note 1. The exhaust system is to be checked for cracks every 25 hours of engine operation.

The tension on the rudder pedals is produced by the return springs at the pedals. If the cables get loose, the springs are to be replaced.

2.2.3 Miscellaneous Maintenance Work

If the aircraft becomes wet, it should be dried by means of a chamois. The best paint suffers from the influence of weather. The life of the paint and the quality of the finish can be improved considerably by careful service and care. It is, however, to be noted that preparations for care of painted surfaces are water repellent and cause the formation of large drops on the surface when it rains; performance and stalling characteristics get worse, accordingly.

If the sailplane is to be stored dismantled, make sure that the wings are underframed at intervals not too large. In any case, one frame is placed under the wing root and another close to rib 15 or the beginning of the aileron. If the plane is stored in a closed room for a longer period of time, occasional ventilation should be provided for. When underframing the fuselage, take care that the bottom part of the fuselage frame is supported at a truss intersection, otherwise bending may result.

The installation of the instruments is to be inspected occasionally. Especially check the tubing for signs of aging and for safety of connections to nipples.

2.2.4 Annual Inspection and Overhaul

Like power airplanes and sailplanes, the powered glider requires an annual inspection necessary for the renewal of the certification. Application for this must be made in time with the local Aeronautical Authority district office.

If it has not already been done, the entire aircraft is to be completely inspected before this annual inspection. Fabric and paint damage is to be repaired. If there is too much play in control system bushings, they have to be replaced. The entire control

system is to be inspected for freedom of play. Control surface deflections are checked. If engine overhauling is necessary, the engine manual is authoritative. Pay particular attention to engine cowling and cooling baffles, since they may crack from vibration.

2.3 Non-Periodic Inspections

In unforeseen events (accidents during road transport, hard landings, off-field landings on unpassable terrain), at least the primary structure of the aircraft is to be checked for damage. Pay particular attention to paint cracks on important fittings, which may indicate overstressing.

2.4 Repairing

Repairs of broken spars and major fuselage repairs must be carried out by the manufacturer or a licensed repair station.

Minor repairs to wooden parts can be performed on consultation with an official inspector.

2.5 Landing Gear

The Falke is provided with a single-wheel landing gear with a 6.00-6 tire. The wheel includes ball-bearings and is practically maintenance free. A tire pressure of 2.1 atü is required.

The tailwheel has a 210x65 tire and also includes ball-bearings. Tailwheel tire pressure: 2.5 atü. The outrigger wheels have 200x50 tires. Tire pressure: 2.5 atü.

3. Equipment

The required minimum equipment is itemized on page 18 of the Flight manual.

A list of additional equipment available is contained in the "Equipment Inventory" delivered with each Falke.

Maintenance of the battery

Every 4 weeks, at least, the quantity of acid should be inspected and distilling water should be filled up, if required.

Correct quantity of acid is between the two red markings.

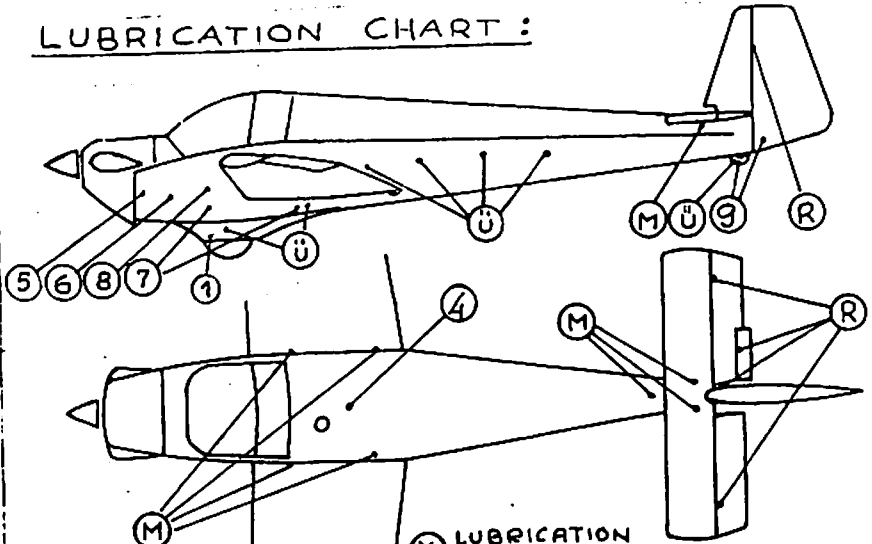
The correct charge of the cells should be determined by measurement of the specific gravity of acid.

If necessary, the battery is to be charged; charging current: 1,5 Ampere.

If the battery is not in use, it is to be charged every month, and discharged and charged each third month.

Keep the battery clean and dry. Grease the connecting terminals with an acid-resisting oil or grease (Vaseline) slightly. Thereby take care that no oil or grease touch the casting material used for sealing.

LUBRICATION CHART :



(X) LUBRICATION POINT

(1) BEARINGS OF THE UNDERCARRIAGE (L)

(2) SPOILER HINGE (Ü)

(3) SPOILER DRIVE, 3 JOINTS + 1 CABLE PULLEY (Ü)

(4) AILERON BELL CRANK (Ü)

(5) RUDDER PEDALS 4x + CABLE FASTENINGS 2x (L)

(6) STICK 3x (L)

(7) TORQUE-TUBE, 2 BEARING PLACES (Ü)

(8) SPOILER LEVER + CABLE PULLEY + CABLE GUIDE (L)

(9) LOWER RUDDER BEARING (SPECIAL CARE) + 2 CABLE FASTENINGS (L)

(R) CONTROL SURFACE BEARING (L)

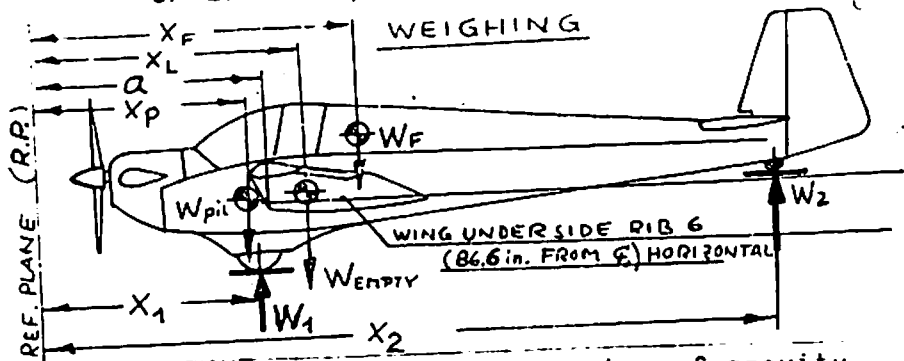
(M) CLEAN AND GREASE BEFORE EACH ASSEMBLY

(Ü) DURING ANNUAL OVERHAUL, DISASSEMBLE AND GREASE OR IF INACCESSIBLE, DURING MAJOR OVERHAUL

(L) ROUTINE CHECKS; OIL OR GREASE IF NEEDED

Parts of Wiring Diagram

- 1 battery: Varta 51 511 (12V; 15 Ah)
- 2 master switch: Bosch 0 341 001 001
- 3 starter relay: Bosch 0 331 005 002 or 0 332 002
102
- 4 starter: Bosch 0 001 160 001
- 5 fuse (battery): ETA 2-5700-K (25A)
- 6 starter switch: Bosch 0 343 004 003
- 7 ignition switch: APR Schaltronic 6-646 N
- 8 flying fuse
- 9 terminal for barograph
- 10 amperemeter: Motometer 150.040.1008
- 11 fuse (generator): ETA 2-5700-K (20A)
- 12 filter (generator): Hisonic Cessna S-1629-1
- 13 regulator (generator): Ducellier 8347 or Wehrle
DU 506 14V
- 14 generator: Ducellier 7522
- 15 fuse box (for more electric consuments): Bosch
0 354 061 001 with 1 351 090 000
- 16 fuse 5A or greater: Bosch DIN 72581 ... A
fuse less 5A: Wickmann 35 101 flink .. A
- 17 oil pressure indicator: Motometer 644.001.1002
- 18 oil pressure sensor: Motometer 675.002.1001
- 19 ignition conduction: RG 58 C/U or 22
- 20 magneto: Bendix-Scigtilla S 4 RN-21 or Slick 4030
- 21 shielded cable 5 mm²: according to LN 9252
FYGPCP AN 10
- 22 shielded cable 1,2 mm²: according to LN 9252
FYGPCP AN 16
- 23 ignition harness: Slick high-temperature harness
- 24 spark plugs: Bosch WB 240 ERT 1
- 25 fuel indicator: VDD 301 252 24 3
- 26 fuel sensor: VDD 21 85
cables: according₂ to LN 9251 colors: ws = white
FYGP AN 16 1,2 mm² rt = red
FYGP AN 10 5 mm² gn = green
FYGP AN 4 22 mm² br = brown
sw = black



When weighing to determine the center-of gravity position set up the motor-sailplane so that the lower surface of the wing at rib 6 (86.6 in. from plane of symmetry) is horizontal.

In this position, a plumb-bob is suspended from the leading edge of the wing at rib 0 to the ground. The reference plane (R.P.) is 78.74 inches, (2 meter) (a in the diagram) ahead of this point. The distances x_1 and x_2 to the wheel centers are measured from the R.P. The two wheels stand on scales and the weights W_1 and W_2 are obtained.

$$\text{From the formula: } x_L = \frac{W_1 \cdot x_1 + W_2 \cdot x_2 - W_f \cdot x_f}{W_1 + W_2 - W_f}$$

results the position of the empty weight center-of-gravity behind the R.P.

Weights in lbs.; distances in inches
 $x_{\text{pilot}} = 74$ in. $x_f = 112.2$ in.

$W_f = \text{fuel quantity in US gal} \times 6.1$

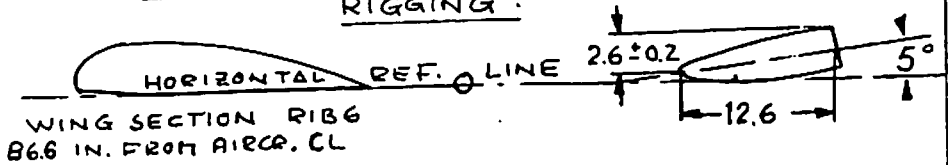
If the fuel tank is empty, terms W_f and $W_f \cdot x_f$ are zero.

The empty weight center-of-gravity must be within the limits shown on page 16 of the Flight manual.

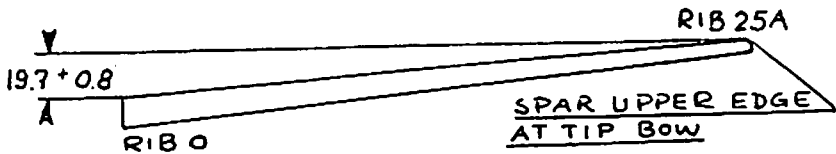
Empty weight W_E (lbs)	860	882	904	926	948
Empty CG-range (inches)	89,11 -	88,99 -	88,87 -	88,80 -	88,68 -
Empty CG-range (inches)	92,38	92,38	92,38	92,34	92,34

ADJUSTMENT DATA

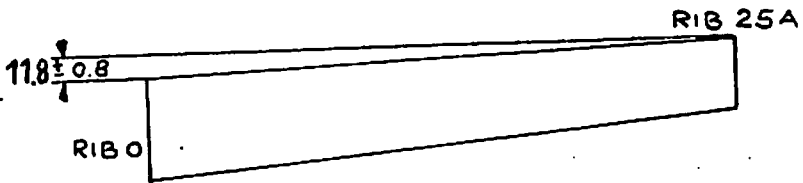
WING - FUSELAGE - STABILIZER
RIGGING :



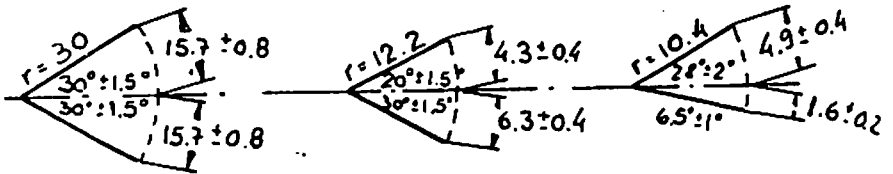
DIHEDRAL :



SWEEP FORWARD :



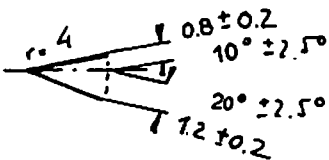
CONTROL SURFACE DEFLECTIONS :



RUDDER

ELEVATOR

AILERONS



TRIM - TAB

DIMENSIONS
IN INCHES

Appendix: Electric Actuator System for Trim Tab actuating.

Optional an electric Trim Tab actuator system can be used against the previous Bowden cable actuating the Trim Tab. For that SB 653-78 is to carry out.

Connecting other electric consumers.

Further circuit breakers may be added to the terminal bar for additional electric consumers This applies to ACL, Nav. lights, VOR, transponder, encoder etc. as well as the electric Trim Tab actuator system It is important to ensure that the additional equipment is using the correct fuse rating (See SB 653-78, SF 25 C).

The aircraft wiring system is 12 V DC, negative to ground.

The appropriate regulations must be observed when fitting additional equipment.

The fuses on the firewall can be replaced with state of the art circuit breakers.

There is then no need for spare fuses and a visual check can be made to see which system has tripped out.

The installation of the electric Trim actuator system is to perform according to the installation instructions of the electric Trim System manufacturer RAY ALLEN Comp. and the SB 653-78 of SCHEIBE-Flugzeugbau GmbH. At installation take care that Needle Position Indicator and Rocker Switch works together logical. Both (Rocker Switch and Needle position indicator) must signed logical with the following pictogram:



Additional to the normal PRE FLIGHT CHECK the bowden cable driven Trim Tab is to check for:

- a) Connection of the Bowden cable to the trim tab on the elevator.
- or
- with the electric trim tab actuator system:
- b) correct electric connection to the trim tab servo (Multipoint plug).
Function check on the ground for proper travel in the correct direction and for correct Trim Tab deflection.

This page is an appendix to the correct Flight- and Maintenance Manual and is to add into the AFM. An entry about this added appendix page is to made on the page „Revision status of the Manual“.